CLAIMS

1. A method for estimating the field received starting from at least one source of electromagnetic field (BTS1, BTS2, BTS3) in a determined position (TM, P) of the territory covered by a communication network (TM; BTS1, BTS2, BTS3) comprising a plurality of sources of electromagnetic field (BTS1, BTS2, BTS3), said method comprising the step of estimating said field on the basis of a propagation model and being characterised by the step of defining said propagation model according to the topologic characteristics of the sources of electromagnetic field of said plurality (BTS1, BTS2, BTS3) in proximity to said determined position (TM, P) of the territory.

2. A method as claimed in claim 1, characterised in that it comprises the steps of:

- identifying at least one parameter (Δ) identifying said topologic characteristics, said parameter (Δ) having a respective range of variability,
- subdividing said range of variability of said parameter (Δ) into a plurality of intervals, and
- using (108), to estimate said electromagnetic field, a different propagation model for each of said ranges of said plurality.

3. A method as claimed in claim 1, characterised in that it comprises the steps of:

- identifying at least one parameter (Δ) identifying said topologic characteristics, and
- estimating (110, 112, 114) said electromagnetic field by using a single propagation model, said single propagation model being modified in parametric fashion as a function of the value of said parameter (Δ) identifying said topologic characteristics.

4. A method as claimed in claim 3, characterised in that said single propagation model is of the type

$$L_P = 10 \cdot \log_{10}\left[\left(\frac{4\pi R}{\lambda}\right)^n\right]$$

where L_P is the attenuation coefficient, R is the distance between said determined position (TM, P) and said at least one source of electromagnetic field (BTS1, BTS2, BTS3), λ is the wavelength of said electromagnetic field and n is an exponent function of said parameter (Δ) identifying the topologic characteristics of said network (TM; BTS1, BTS2, BTS3).

5. A method as claimed in claim 3 or claim 4, characterised in that said single propagation model is a function of an index (n) linked to said at least one parameter (Δ) by a relationship of the type

n=A-B.log(d_net),

where n is said index, d_net=Δ is said parameter identifying the topologic characteristics of said network, A and B scaling constants.

6. A method as claimed in claim 1, applied to a cellular communication network, characterised in that it comprises the step of modifying said propagation model according to a parameter (Δ) identifying the density of the cells of said cellular network.

7. A method as claimed in claim 1, applied to a cellular communication network, characterised in that it comprises the step of modifying said propagation model according to a parameter (Δ) identifying the distance of said determined position (TM, P) with respect to the source of electromagnetic field of said plurality (BTS1, BTS2, BTS3) that is closest to said determined position (TM, P).

8. A method as claimed in claim 7, characterised in that it comprises the steps of:

- associating to each cell of said cellular network a reference distance (d_bari) representing the distribution of the sources of electromagnetic field of said plurality (BTS1, BTS2, BTS3),

- associating to said determined position (TM, P) a cell distance (d_cell) identifying the distance between said determined position and the source of electromagnetic field of said plurality (BTS1, BTS2, BTS3) that is closest to said determined position (TM, P), and

- identifying said parameter (Δ) which identifies the topologic characteristics of said network as the greater value between said cell distance (d_cell) and a multiple of said reference distance (d_bari).

9. A system for estimating the field received starting from at least one source of electromagnetic field (BTS1, BTS2, BTS3) in a determined position (TM) of the territory covered by a communication network (TM; BTS1, BTS2, BTS3) comprising a plurality of sources of electromagnetic field (BTS1, BTS2, BTS3), said system comprising at least one processing unit (LS, TM) configured to estimate said field on the basis of a propagation model that is modifiable according to the topologic characteristics of the sources of electromagnetic field of said plurality (BTS1, BTS2, BTS3) in proximity to said determined position (TM, P) of territory.

10. A system as claimed in claim 9, characterised in that said at least one processing unit (LS, TM) is configured to:

- identify at least one parameter (Δ) identifying said topologic characteristics, said parameter (Δ) having a respective range of variability,

- subdivide said range of variability of said parameter (Δ) into a plurality of intervals, and

- use (108), to estimate said electromagnetic field, a different propagation model for each of said intervals of said plurality.

11. A system as claimed in claim 9, characterised in that said at least one processing unit (LS, TM) is configured to:

- identify at least one parameter (Δ) identifying said topologic characteristics, and

- estimate (110, 112, 114) said electromagnetic field by using a single propagation model, said single propagation model being modified in parametric fashion according to the value of said parameter (Δ) identifying said topologic characteristics.

12. A system as claimed in claim 11, characterised in that said single propagation model is of the type

$$L_P = 10 \cdot \log_{10}\left[\left(\frac{4\pi R}{\lambda}\right)^n\right]$$

where L_P is the attenuation coefficient, R is the distance between said determined position (TM) and said at least a source of electromagnetic field (BTS1, BTS2, BTS3), λ is the wavelength of said electromagnetic field and n is an exponent function of said parameter (Δ) identifying the topologic characteristics of said network (TM; BTS1, BTS2, BTS3).

13. A system as claimed in claim 11 or claim 12, characterised in that said single propagation model is a function of an index (n) linked to said at least one parameter (Δ) by a relationship of the type

n=A-B.log(d_net),

where n is said index, d_net=Δ is said parameter identifying the topologic characteristics of said network, A and B scaling constants.

14. A system as claimed in claim 9, associated to a cellular communication network, characterised in that said at least one processing unit (LS, TM) is configured to modify said propagation model according to a parameter (Δ) identifying the cell density of said cellular network.

15. A system as claimed in claim 9, associated to a cellular communication network, characterised in that said at least one processing unit (LS, TM) is configured to modify said propagation model according to a parameter (Δ) identifying the distance of said determined position (TM, P) from the source of electromagnetic field of said plurality (BTS1, BTS2, BTS3) that is closest to said determined position (TM).

16. A system as claimed in claim 15, characterised in that said at least one processing unit (LS, TM) is configured to:

- associate to each cell of said cellular network a reference distance (d_bari) representing the distribution of the sources of electromagnetic field of said plurality (BTS1, BTS2, BTS3),
- associate to said determined position (TM, P) a cell distance (d_cell) identifying the distance between said determined position and the source of electromagnetic field of said plurality (BTS1, BTS2, BTS3) that is closest to said determined position (TM, P), and
- identify said parameter (Δ) identifying the topologic characteristics of said network as the greater value between said cell distance (d_cell) and a multiple of said reference distance (d_bari).

17. A communication network (TM; BTS1, BTS2, BTS3) incorporating a system as claimed in any of the claims 9 through 16.

18. A network as claimed in claim 17, characterised in that it is a network for mobile communications.

19. A communication network resulting from the application of the method as claimed in any of the claims 1 through 8.

20. A communication network terminal comprising a processing unit (10) configured (12) to implement the method as claimed in any of the claims 1 through 8.

21. A method for simulating a mobile radio network, able to use a simulation of the physical layer of the network, characterised in that it comprises a method for estimating the field as claimed in any of the claims 1 through 8.

22. A method for planning a mobile radio network, characterised in that it comprises a method for estimating the field as claimed in any of the claims 1 through 8.

23. A method for locating mobile terminals in a mobile radio network, characterised in that it comprises a method for estimating the field as claimed in any of the claims 1 through 8.

24. A computer program product able to be loaded into the memory of at least one electronic computer and comprising portions of software code for implementing the method as claimed in any of the claims 1 through 8.